

DRYDOCKING

1. SCOPE

1.1 Scope. This work item describes the requirements for the Contractor to drydock and undock Coast Guard vessels (see section 5.1 Definitions).

1.2 Appendices. The following appendices apply to this standard specification:

TITLE	APPENDIX
Requirements For Routine Drydocking Work	<u>A</u>
Requirements For Calculations	<u>B</u>
Requirements For Small Boat Haul-Outs	<u>C</u>
Requirements For Docking and Lifting Cradles	<u>D</u>
Requirements For Facility Inspection	<u>E</u>
Docking and Undocking Checklists	<u>F</u>

2. APPLICABLE DOCUMENTS

MIL-PRF-83483, Feb 1998, Thread Compound, Anti-seize, Molybdenum Disulfide Petrolatum

MIL-STD-1625, Dec 1992, Safety Certification Program for Drydocking Facilities and Shipbuilding Ways for U.S. Navy Ships

Coast Guard Maintenance and Logistics Command Atlantic (MLCA) Standard Specification 0000_STD, 2004 Edition, General Requirements

Coast Guard Drawing 87 WPB 085-012, Rev-, Lifting Cradle

Coast Guard Drawing 110 WPB 085-002, Rev-, Docking Plan

Coast Guard Drawing 110 WPB 085-010, Rev A, Docking Plan, Docking/Lifting Cradle

Coast Guard Drawing 123 WPB 100-002, Rev-, Docking Plan

Naval Ships' Technical Manual (NSTM) Chapter 997, Nov 1996,
Docking Instructions and Routine Work in Drydock

The Society for Protective Coatings (SSPC)/NACE International
(NACE) Joint Surface Preparation Standard SSPC-SP 12/NACE No.5,
2002, Surface Preparation and Cleaning of Steel & Other Hard
Materials by High and Ultrahigh Pressure Water Jetting

3. REQUIREMENTS

3.1 General. The Contractor shall drydock and undock the
designated vessel, using the applicable Coast Guard Docking Plan
Drawing listed in the work item.

3.2 Scheduled events.

3.2.1 Pre-docking events. The Contractor shall accomplish the
following:

3.2.1.1 Vessel's information. Request any additional
information necessary for performing drydock calculations from
the Contracting Officer's Representative (COR). Be aware that
the COR will normally provide the information within 24 hours of
receiving the written request.

3.2.1.2 Seventy two hours before docking. Submit any alternate
blocking arrangement details and calculations as required in
Appendix B, 72 hours prior to docking.

3.2.1.3 Forty eight hours before docking. Submit all required
calculations, include those specified in Appendix B, as required,
48 hours prior to docking.

3.2.1.4 Twenty four hours before docking. Convene the pre-
docking conference a minimum of 24 hours prior to docking (see
paragraph 3.3 (Pre-docking conference)).

3.2.2 Docking events. The Contractor shall accomplish the
following:

3.2.2.1 Seventy two hours after arrival. During daylight hours
safely drydock the vessel. Dock the vessel in one continuous
evolution. Dock the vessel within 72 hours after the vessel has
arrived at the Contractor's facility, except in the case where a
pre-docking shaft alignment check is to be performed. When a
pre-docking shaft alignment is being performed, ensure that the
vessel is drydocked within 120 hours after arrival.

3.2.2.2 Within four hours after docking. Within four hours after docking, start the hull cleaning tasks, as specified in 3.7 (Underwater body surface cleaning). Complete the hull cleaning before marine growth hardens.

3.2.2.3 Twenty four hours after docking. Begin the "Immediate work", as specified in 3.8 "Immediate work".

3.2.3 Undocking events. The Contractor shall accomplish the following:

3.2.3.1 Forty eight hours before undocking. Notify the COR, in writing, at least 48 hours before the estimated time of undocking. Submit the undocking calculations required in Appendix B.

3.2.3.2 Twenty four hours before undocking. Convene the undocking conference (see 3.11 (Undocking conference)).

3.2.3.3 Twelve hours before undocking. Twelve hours before undocking, accomplish the following:

- Remove protective coverings (see 3.9 (Protective covering removal)).
- Submit the pre-undocking report to the COR (see 3.11.2 (Pre-undocking report)).

3.2.3.4 Forty eight hours after undocking. Within 48 hours after undocking the vessel, submit to the COR the documentation of drydocking significant events, as specified in 3.14 (Documentation of drydocking significant events).

3.3 Pre-docking conference. The Contractor shall schedule the pre-docking conference one week in advance of the conference. At the pre-docking conference, accomplish the following:

3.3.1 Drydock certification submittal. Submit to the COR certification for the drydock to be used to lift the vessel. Ensure that the drydock is certified for docking a vessel of the dimensions specified in the Principal Characteristics section of the specification package, by one of the following:

- MIL-STD-1625.
- American Bureau of Shipping (ABS).
- An independent, registered Professional Engineer, who shall satisfactorily complete the appropriate sections of Appendix E.

3.3.2 Certification inclusions. Regardless of the type of certification provided, submit to the COR, in writing, the following information regarding the docking facility, as applicable:

- Fire alarm locations.
- Emergency power.
- Emergency ballast/dewatering pumps.

3.3.3 Drydocking procedure documentation. Provide to the COR a written drydocking procedure, which shall include the following:

- A short statement of operating practices, safety requirements, and yard security plans.
- The flooding and pumping plan for the drydock.
- Specific list and trim of the vessel during docking and undocking.
- Any special precautions or actions characteristic to the docking facility, the docked vessel, or a combination thereof.

3.3.4 Discuss all items on the Pre-Docking Conference checklist in Appendix F, to the satisfaction of the COR.

3.4 Block construction. The Contractor shall arrange keel and bilge blocks, as shown on the vessel's docking plan, ensuring the following:

- The height of the vessel's keel and bilge blocks above the working surface is within 1/4-inch of height dimensions and within 1" of the longitudinal and within 1/2" of the transverse distances shown on the vessel's docking plan, unless otherwise specified.
- The soft caps on the keel and bilge blocks are a minimum of 2" and a maximum of 6" thick. In no case should the keel soft caps be thicker than those on the bilge blocks.
- Reused soft caps are free from any permanent deformations, crushing, cracks or other material defects.
- The line of action of the normal force for all blocking passes through the middle one-third of the block as shown in Figure 1 "Bilge Block Construction".
- All keel blocks are fabricated of the same materials, all bilge blocks are fabricated of the same materials; and the bilge blocks are not of stiffer construction than the keel blocks.

- Bilge blocks higher than 6', as measured from the bottom of the block to the highest point of the soft cap, shall be tied together in pairs by means of cribbing or bracing. If the side blocks are tied together, then they must be hauled together.
- When bracing two blocks together, the minimum acceptable material will be four 2x6 wooden planks in a cross-braced pattern and lag bolted in place. See Figure 2 - "Braced Bilge Blocks".
- When keel blocks are higher than 6', the keel blocks shall be cribbed together in the forward and after 1/3 of the keel block line. Cribbing shall be a minimum of 12" thick when used with timber blocks.
- The Contractor shall place all blocks on a solid foundation such as concrete, steel dock floors, or cradle fixtures. Ensure that no block base shall rest on gravel, sand or other non-permanent foundation.

3.4.1 Block inspection. The Contractor shall not remove any instruments used to set block heights and verify block position until the COR has completed a block inspection. The Contractor shall establish a centerline and baseline. The dock floor shall not be considered a baseline unless it can be proven flat.

3.5 Docking.

3.5.1 Assistance for safe docking of vessel. The Contractor shall provide all resources necessary to safely drydock the vessel. Resources shall include, but shall not be limited to, tugs and/or pusher boats, as necessary. The Contractor shall not use shipboard winches or any other deck machinery to control or winch the vessel into position, but may use appropriate attachment points on the vessel to secure and control the vessel during the docking and undocking evolution.

3.5.2 Divers. The Contractor shall use divers to monitor block clearance when the distance between the hull and the blocks is expected to be nine inches or less during the positioning of the vessel at the time of docking and undocking. Divers shall follow all applicable OSHA rules.

3.5.3 Cranes. The Contractor shall be aware that cranes located on wingwalls of floating drydocks must be secured amidships during the docking and undocking evolution.

3.5.4 Operational limits. The Contractor shall operate the drydock with the following limitations:

- Floating drydock freeboard (For floating drydocks: the final lifted pontoon deck freeboard shall be 12 inches.)
- Trim between the blocks and keel shall not exceed 1 foot per 100 feet of length during the landing of the vessel. Once the vessel is fully landed, a maximum ship/dock trim of 4 feet per 100 feet of length shall not be exceeded at any time.

3.5.5 Hull and block interface inspection. Immediately after the vessel has been lifted, the Contractor shall perform the following inspections:

- Examine all blocks for total contact.
- Shim the blocks as necessary to provide total, even block contact with the vessel's hull.
- Refloat the vessel and take corrective action, if any tendency to strain or injure the vessel is observed, or if the vessel is more than 6 inches off the center of the keel blocks. Document corrective measures taken for the COR before continuing with docking.

3.5.6 Grounding strap. Immediately after successful drydocking and before installing the electrical shore tie cable to the vessel, the Contractor shall ground the vessel's hull to a shoreside grounding source as follows:

3.5.6.1 Cable lugs. Tightly secure the grounding cable lugs to the grounding plates; ensure that the lug contact area is cleaned thoroughly to bare metal, and that resistance of the connection is a maximum of 125 microhms.

3.5.6.2 Cable size. Ensure that the cross sectional areas of return ground cables are one million circular mils minimum for each 1000 A for each 100 feet (One or more cables, connected in parallel, may be used to meet the minimum cross-sectional area requirements).

3.5.7 Water supplies. The Contractor shall accomplish the following:

3.5.7.1 Cooling water. Provide fresh or salt water and furnish all hoses and fittings necessary to supply water to the vessel's auxiliary salt water (if installed), air conditioning, and refrigeration cooling systems. Ensure cooling water exiting the vessel is kept from running down the hull. Maintain the water supply pressure from 20 to 40 psig and provide a pressure gauge calibrated to be accurate in this range.

3.5.7.2 Firemain system. Provide fresh or salt water to the vessel's firemain connection on deck for fire protection. Maintain the pressure between 90 and 110 psig to the vessel, while discharging 90 to 110 gpm solid streams through two 1-1/2 inch fire hoses. Ensure that the firemain system is protected from freezing, when applicable.

3.5.7.2.1 Contractor-furnished property. Provide all hoses and fittings needed to supply water to the system and a pressure gauge to show the water pressure at the connection to the ship.

3.5.7.2.2 Additional supply lines. Should any portion of the firemain system be secured due to system repairs, provide additional supply lines to pressurize all working portions of the system and maintain the flow rate specified above.

3.5.7.2.3 Booster pumps. Booster pumps, if used and not in continuous operation, shall be fitted with a controller or starter switch located near the gangway, readily available to the crew.

3.5.7.3 Water supply safeguard. Safeguard the water supply taken from a fresh water system in compliance with local ordinances and U.S. Public Health Service regulations.

3.5.8 Access to hull fittings. The Contractor shall ensure that no obstructions exist between the drydock surface and the hull openings or fittings. Provide horizontal and vertical clearance to remove and replace rudders, fin stabilizers, transducers, sonar domes, retractable bow thrusters, and other appendages, as applicable, whether or not removals are required as a part of the specification package.

3.5.9 Modification of weight. The Contractor shall ensure that no weight, including liquids such as fuel or water, is shifted, added, or removed from the vessel while the vessel is in the docking facility, unless specifically authorized by the dockmaster.

3.5.10 Watertight integrity. The Contractor shall accomplish the following tasks during drydocking availabilities scheduled between 1 April and 1 November:

- Provide temporary closure plates and fastenings prior to removing plates or cutting access openings below four feet of waterborne freeboard. Ensure that such closure plates are available within 48 hours of notice for emergency sealing of temporary access openings.
- Secure openings at the end of each shift not immediately followed by another shift engaged in drydock work.
- Secure vulnerable compartments in order to minimize potential damage to the extent permitted by scope and urgency of work when an area of shell plating removal makes temporary closure impracticable.
- Schedule underwater hull operations to maintain the vessel's positive stability and maximum hull watertight integrity in the event of flooding.
- Remove the temporary closures when the breach of watertight integrity no longer exists.

NOTICE!

<p>This requirement does not apply to the Great Lakes and Western rivers areas.</p>
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3.6 Interferences. The Contractor shall, in accordance with Std Spec 0000_STD, handle all interferences to the cleaning and inspection of the hull, which include, but are not limited to the following:

- Fairwaters (if applicable).
- Coupling covers.
- Inspection plates.
- Sea chest gratings

3.7 Underwater body surface cleaning.

3.7.1 Hull and appendages. The Contractor shall clean the entire underwater hull, appendages, and sea chest strainer plates and interiors by water-jetting to a "WJ-4" visual surface condition, in accordance with SSPC-SP 12/NACE No. 5, supplemented by stiff bristle brushes and scrapers as necessary, to remove all visible marine growth, loose rust, loose mill scale, and loose coatings; and reduce chloride surface contaminants to a level of 3 micrograms per square centimeter or less. Take extreme care to avoid damaging or removing existing intact underwater body coating. Do not use chemical additives in the freshwater wash,

or scrapers on bearing surfaces or transducer faces.

3.7.2 Zinc anodes. Remove all marine growth and oxide coating from all hull, rudder, shaft strut, sea chest, z-drive, and thruster tunnel zinc anodes, as applicable, using a light-wire brush.

3.8 Immediate work. The Contractor shall perform the following work within 24 hours after the lifting of the vessel.

3.8.1 Temporary protective coverings. As soon as practicable after drydocking and underwater body surface cleaning, install protective coverings over zinc anodes, propeller blade seals, rudder bearings, stern tube and strut bearings, spool pieces, spud wells, fin stabilizer seals and bow thrusters, as applicable. Wrap all bearings and seals immediately after the vessel is drydocked to prevent entry of debris, abrasives, and paint during cleaning, surface preparation, and painting. Insert soft caulking material into the open ends of rudder and shaft stave bearings to prevent entry of grit or other foreign material.

NOTICE!

Do not remove protective covers except for inspection or accomplishing specific work items.
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3.8.2 Overboard discharge plugging. Place drain channels in overboard discharges in use to direct discharges away from the hull. Provide and install wooden plugs or coverings in sea chest spool pieces and overboard discharges not in use to prevent entry of sandblast grit or paint.

3.8.3 Transducer cover plate installation. Install Government-furnished cover plates over transducers.

3.9 Protective covering removal. After completing all underwater body work, and at not earlier than 12 hours before undocking the vessel, the Contractor shall remove and dispose of all temporary protective coverings.

3.10 Required notification prior to inspections. The Contractor shall notify the COR at least 24 hours prior to performing each required inspection.

3.11 Undocking conference. The Contractor shall schedule the undocking conference a minimum of four working days in advance of the undocking. At the undocking conference, the Contractor shall accomplish the following:

3.11.1 Submit to the COR calculations required in Appendix B, including the effect of all dock master authorized weight additions, removals or shifts as a result of ship's actions or the contracted scope of work.

3.11.2 Submit to the COR a written report attesting that the following conditions have been met:

- All transducers are uncovered.
- Zincs are uncovered and free of paint.
- Shaft rope guard and fairwaters are in place.
- All hull opening blanks and plugs are removed.
- All sea chest strainers are bolted in place and lockwired or otherwise permanently secured as before being disturbed.
- All sea valves and waster pieces are properly installed and are in the closed position.
- All underwater body work has been completed.
- Drydock is free of all debris and blasting material.

3.11.3 Discuss all items on the Pre-Undocking Conference Checklist in Appendix F, to the satisfaction of the COR.

3.12 Undocking preparations. The Contractor shall provide personnel experienced in undocking operations and equipped with tools and appropriate communication devices. Station Contractor personnel at all hull openings associated with work done by the Contractor during this availability.

3.13 Undocking. Upon completion of all scheduled work, the Contractor shall safely undock the vessel.

3.14 Documentation of drydocking significant events. The Contractor shall submit the following information in a separate written report to the COR within 48 hours after undocking the vessel.

- The precise time that the vessel's first extremity crossed the drydock boundary upon docking.
- The precise time that the vessel's last extremity crossed the drydock boundary upon undocking.
- The forward and aft draft readings just before docking and immediately after undocking.

3.15 Personnel. The Contractor shall provide qualified docking personnel and a qualified dockmaster as follows:

3.15.1 Docking personnel. Provide written certification for the dockmaster and all docking personnel to the COR. Ensure that the certification states, as a minimum, that the Contractor certifies that the individuals are qualified for the specific station(s) or job(s) that they will perform during docking and undocking a vessel of this size or greater at this facility. In addition, do the following:

3.15.1.1 Manning document. Provide a list of drydocking operations that describes all stations to be manned, functions to be performed, and the experience and training qualifications of personnel carrying out each function, including casualty and damage control qualifications.

3.15.1.2 Dockmaster. Ensure that the dockmaster assigned by the Contractor provides a resume of training and experience, and meets one of the following criteria:

- Has served as a dockmaster at the type of facility for which the individual is qualified during at least 10 dockings or undockings, of which one has been accomplished within the previous 6 months.
- Has served under a dockmaster in an apprentice or assistant role during at least 20 dockings or undockings, of which 10 have been performed at the type of facility for which the individual is qualified. One docking or undocking shall have been conducted within the previous 6 months.
- Has served under a dockmaster in an apprentice or assistant role during at least 10 dockings or undockings and has served as a dockmaster at the type of facility for which the individual is qualified during at least 5 dockings or undockings, of which one has been accomplished within the previous 6 months.

4. QUALITY ASSURANCE

4.1 Report criteria. The Contractor shall ensure all reports required are submitted in accordance with Std Spec 0000_STD.

5. NOTES

5.1 Definitions.

5.1.1 Vessel. The term "vessel", as used in this specification, refers to the cutter, tender, boat, and barge, if applicable.

5.1.2 Drydock terms. All references to drydock facilities, as used in this specification, include graving drydocks, floating drydocks, marine railways, building ways or vertical lifts. The term "haul-out" refers to travel lifts and cranes.

5.1.3 Knuckle load. When the ship and drydock have different trims the keel block that comes in contact with the ship first generates a load on the block, this load is called a "knuckle load".

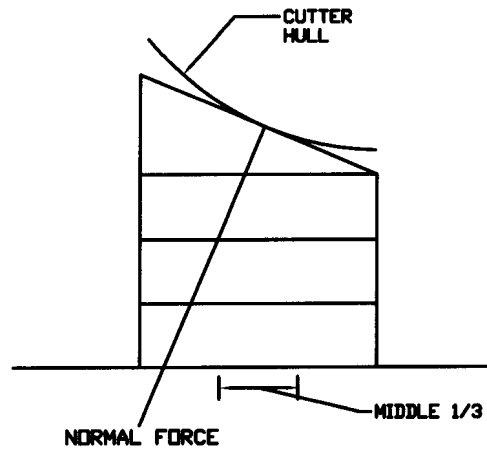
5.1.4 High Wind. Wind speed exceeds 90 knots or 100 mph.

5.2 Unit responsibility.

5.2.1 Arrival conditions. The Engineer Officer (EO) or the Engineering Petty Officer (EPO) will advise the Contractor of the actual tank and draft readings when the vessel arrives. The EO or EPO will discuss with the Contractor any ballasting requirements necessary to accommodate the vessel draft and trim requirements outlined above.

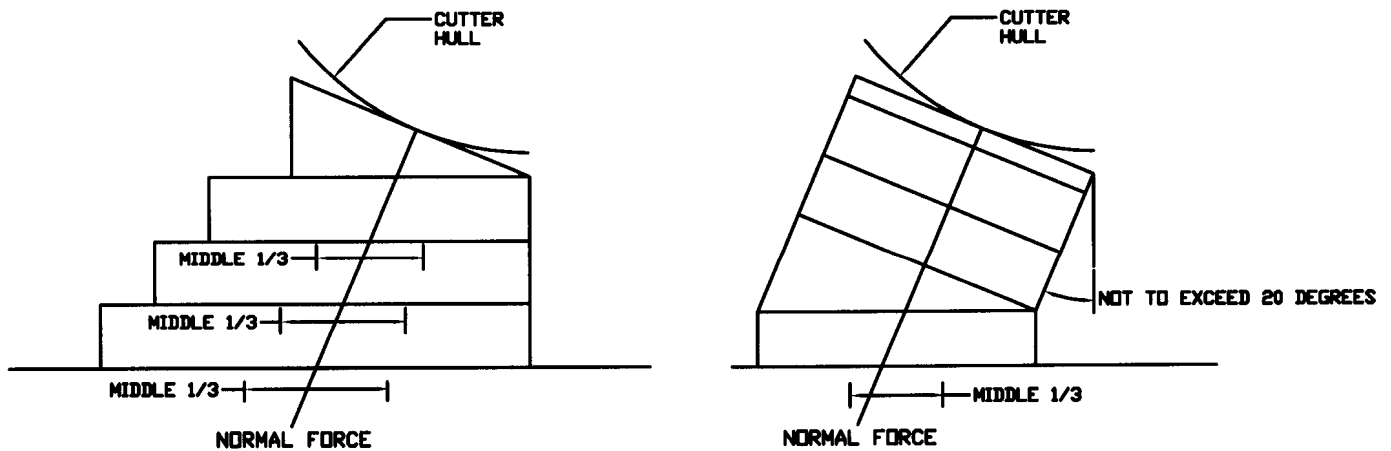
5.2.2 Drydock procedures. The EO or EPO is strongly encouraged to review NSTM Chapter 997, to become familiar with docking and undocking procedures, block loadings, docking stability, etc.

5.2.3 Checklists. Checklists for before, during and after the docking and undocking evolutions are located in Appendix F. The COR shall be responsible for completing these checklists.



NOT AUTHORIZED

NORMAL FORCE PASSES OUTSIDE MIDDLE 1/3



AUTHORIZED OPTIONS

NORMAL FORCE PASSES WITHIN MIDDLE 1/3

Figure 1 - BILGE BLOCK CONSTRUCTION

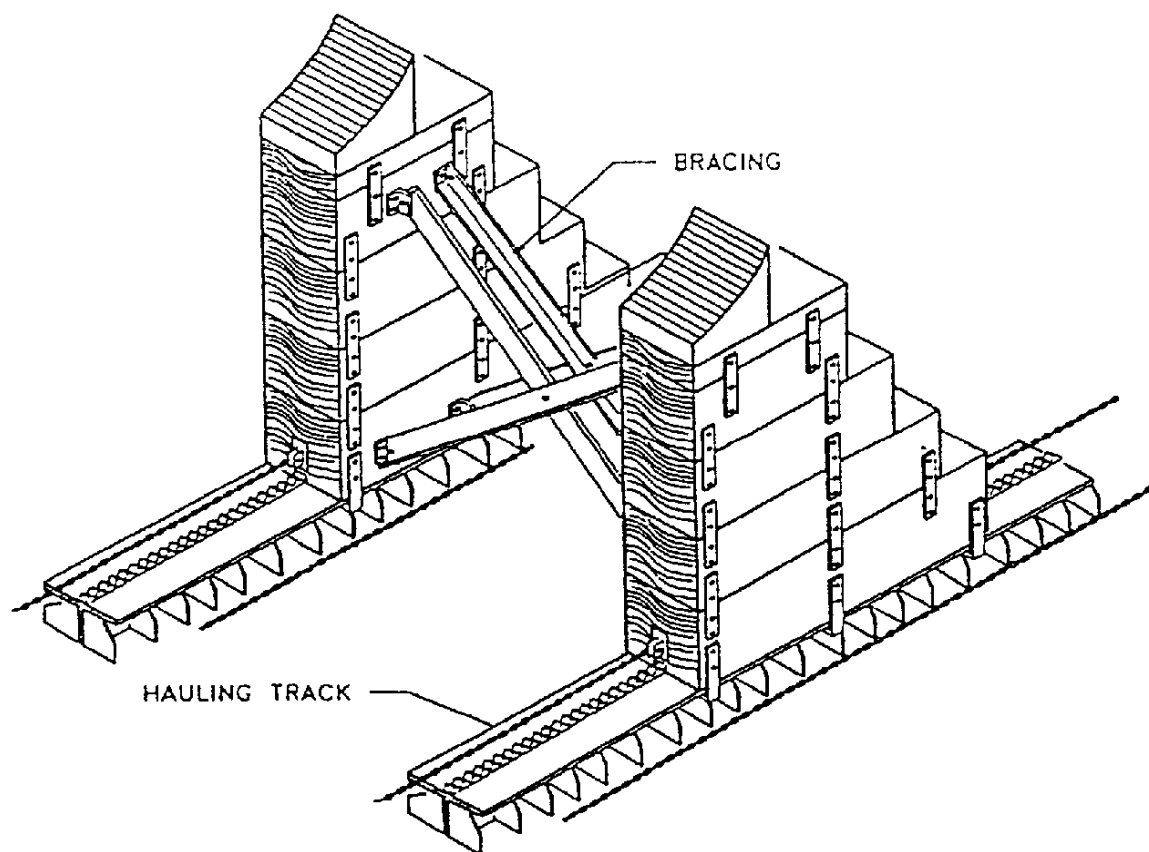


Figure 997-I-6. Haulable Braced Bilge/Side Blocks

Figure 2 - BRACED BILGE BLOCKS

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APPENDIX A

REQUIREMENTS FOR ROUTINE DRYDOCKING WORK

10. SCOPE

10.1 Scope. This appendix describes the particular requirements for the Contractor to perform routine work while the vessel is in drydock.

20. REQUIREMENTS

20.1 Underwater hull survey. After the underwater body surfaces have been cleaned, and the COR has convened the Coast Guard Underwater Hull Inspection Board (UWHIB), the Contractor shall provide a hull repair supervisor and a marker to assist the UWHIB to survey the underwater body condition. Do not begin any surface preparation or painting, until the UWHIB has completed the initial underwater body survey. Provide equipment for safe access to all areas of the underwater hull.

20.2 Inspections and repair work. Within 5 days, the Contractor shall complete the below inspections and repair work, as applicable. Submit a CFR for each completed inspection.

20.3 Packing material renewal. For propeller shafts or rudder stock equipped with packing, the Contractor shall remove the packing before taking bearing clearances; document the amount of removed packing, and after all authorized propeller shaft or rudder stock work has been completed, renew packing material, in accordance with the applicable shaft or rudder drawings.

20.4 Stern tube and strut bearing inspection. The Contractor shall measure port, starboard, top, and bottom clearances on the forward and after ends of all stern tube and strut bearings when applicable. Note the type of instrument used and the depth of the measurements. Examine and note the condition of all seals.

20.5 Propeller and shaft inspection. The Contractor shall visually inspect the propellers and shafts for damage or defects. After completing inspections and in conjunction with any other propeller work, clean and polish the propeller surfaces to a minimum of 63 microinches uniform roughness.

20.6 Rudder inspection. The Contractor shall measure the rudder

bearing clearances at 90-degree intervals at both upper and lower ends of rudder stave bearings. Remove and reinstall any bearing retainers as necessary to facilitate measurement taken.

20.7 Void inspection. The Contractor shall accomplish the following tasks for each inaccessible void space (including, but not limited to rudders, skegs, stabilizer fins, struts, bilge keels, rub rails and transducer blisters):

- Remove and dispose of the void plug.
- Drain all existing fluid contents from the void; dispose of removed fluids in accordance with all applicable Federal, state, and local regulations. Submit a CFR indicating the amount of fluids removed.
- After all authorized repairs, if any, furnish and install a new 316 stainless steel void plug; coat all plug threads with molybdenum disulfide petrolatum, an anti-seize compound, conforming to MIL-PRF-83483, before installation.

20.8 Zinc anode inspection. The Contractor shall perform an inspection of all existing zinc anodes, as applicable; check the soundness of mounting strap and/or stud welds, missing fasteners, and percentage of remaining material. Submit to the COR a written report of findings within 24 hours after completing the inspection.

30. QUALITY ASSURANCE

No additional requirements.

40. NOTES

None.

APPENDIX B

REQUIREMENTS FOR CALCULATIONS

10. SCOPE

10.1 Scope. This appendix describes the particular requirements for the contractor to perform drydock calculations.

20. REQUIREMENTS

20.1 General. The Contractor shall submit a minimum of three sets of drydock calculations for approval: Pre-award, Docking and Undocking. Ensure that all calculations are performed by a Registered Professional Engineer.

20.2 Pre-award calculations. The Contractor shall submit to the KO a preliminary pre-award set of calculations, as described in Table 1. Be aware that the only block loading calculation required for pre-award calculations is the trapezoidal block loading, and that the calculations should reflect the values of the principal characteristics of the vessel and may not reflect the ships arrival condition.

20.2.1 Alternate blocking evaluation. The Contractor shall submit a sketch of any blocking arrangement that differs from the approved blocking plans.

NOTICE!

Pre-award calculations are required to prove the Contractor can dock the vessel. Once a Contractor has submitted the pre-award calculations for a class of vessel, he may request a waiver from this requirement unless the block height has increased, the vessel has significantly changed, or the docking facility has been modified.

20.3 Docking calculations. The Contractor shall submit the calculations, as described by Table 1, for the condition of the vessel as it enters the drydock. Ensure that any work that is performed by the Contractor or vessel crew after arrival at Contractor's facility, prior to docking, that affects the stability condition is incorporated into the calculations. Submit all calculations to the COR 48 hours before docking.

20.4 Undocking calculations. The Contractor shall submit calculations, as described by Table 1, at the undocking conference, at least 48 hours before undocking. If there have been no significant changes to the vessel or dock during the availability, the Contractor may request a waiver from this requirement.

TABLE 1. DOCKING CALCULATIONS REQUIREMENTS

CALCULATIONS	TYPE OF DRYDOCK♦				
	Floating	Graving	Marine Railway	Vertical Lift	Travel lift
*▲Blocking (20.5)	X	X	X	X	X
▲Stability for vessel afloat	X	X	X	X	
Vessel stability for keel touch	X	X	X	X	
Draft at instability	X	X	X	X	
Vessel's GM when side blocks are hauled (20.5.4)	X	X	X	X	
*▲System stability when water is at top of blocks	X				
*▲System stability when pontoon deck is awash	X				
*▲System stability when pontoon deck breaks surface	X				
*▲System stability when the GM is less than 5 feet (20.6)	X				
▲Stabilizing moment (20.7)			X	X	X
*▲Pumping plan (20.8)	X				
Cable or strap tension				X	X

*Required for Pre-award calculations.

▲ Calculations required for all classes of 110 WPB's and barges and vessels with flat bottoms

♦See 20.9 (Travel lift and crane calculations) for guidance on required calculations.

NOTICE!

All stability calculations must include the vertical center of gravity above the keel (KG), metacenter height above the keel (KM), metacentric height (GM) and drafts for the ship and ship/dock system if applicable.

20.5 Blocking calculations. The Contractor shall provide the following blocking calculations.

- Knuckle load and resulting block stress.
- Keel Loading per foot (trapezoidal.
- Number of side blocks required for high wind forces.
- Soft cap material used.

NOTICE!

The only blocking calculation required for vessels utilizing cradles is the Loading per foot (trapezoidal) calculation.

20.5.1 Allowable block timber stresses. The contractor shall use the Permissible Compressive Stress in the table below as the source for safe allowable wood stresses when calculating side and keel block loads. The Proportional Limit loads are to be used when calculating the block stress due to the overturning moment in paragraph 40.1.

WOOD PROPERTIES			
Block Material	Permissible Compressive Stress Perpendicular to the grain (psi)	Permissible Compressive Stress Parallel to the grain (psi)	Proportional limit Perpendicular to the grain (psi)
Douglas Fir	400	1400	800
Red & White Oak	600	1300	1300
Yellow Pine	300	900	700

20.5.2 Additional blocks. The Contractor may propose additional keel and side blocks, if needed to ensure block loadings are not exceeded during any anticipated underwater body work. Be aware that additional blocking shall be considered an alternate blocking arrangement and must meet the requirements in (20.5.3 (Alternate blocking)).

20.5.3 Alternate blocking. The Contractor shall submit an alternate blocking arrangement for approval to the KO at least 72 hours prior to docking, if the blocking arrangement shown on the vessel's docking plan does not match the drydock's construction or the docking plan shows keel or bilge blocks as interferences to scheduled work. Ensure the moved blocks rest on adequate dock and ship structure. Provide calculations for determining the heights and loadings of the modified blocks, and a clear sketch

showing, in relationship to the vessel, the number, size and spacing of the modified blocks.

20.5.4 Bilge block hauling. If applicable, the Contractor shall ensure hauling of bilge blocks occurs with a minimum ship GM of 1 foot. Drafts of the cutter shall be included in the calculations.

20.6 GM requirements. The Contractor shall ensure that the ship-dock system complies with the following GM requirements:

- For docks with lifting capacities of 10,000 long tons (LT) or less, the minimum GM of ship/dock system shall be 5 feet for all portions of the planned lift. As a safety precaution, for conditions other than planned, the ship-dock system shall have a minimum GM of 2 feet with a level trim condition with the pontoon deck below the water surface.
- For docks with capacities greater than 10,000 LT, minimum GM shall be in accordance with Figure 4 of MIL-STD-1625.

20.7 Stabilizing moment. For marine railways and building ways, the Contractor shall submit additional calculations for overturning and stabilizing moments. Ensure that the stabilizing moment is at least 25% greater than the overturning moment, and that moments take into account wind and current loads. See Appendix B, 40.1 "Overturning moment formula".

NOTICE!

<p>This formula only applies to a ship on a railway.</p>

20.8 Pumping plan. The Contractor shall submit to the COR a plan detailing the drydock tank levels for each stage of required stability calculations. Ensure that each tank is dewatered in proportion to the load distributed above the tank. Be aware that pressing up or emptying dock ballast tanks to obtain adequate GM by minimizing free surface effect is not acceptable. See Appendix B, 40.2 "Pumping plan formula".

20.9 Travel lift and crane calculations. The Contractor shall calculate the load on each strap or lifting cable. Ensure the following:

- The load is based on the weight distribution of the vessel.
- All lifting straps shall be inspected by the port engineer prior to lifting the vessel.
- Any straps observed to have abnormal cuts, frays or wear shall be replaced prior to lifting the vessel.

- All strap loads shall be within 20% of each other.

Block foundation. The Contractor shall place all blocks on a solid foundation such as concrete, steel dock floors, or cradle fixtures. Ensure that no block base shall rest on gravel, sand or other non-permanent foundation.

30. QUALITY ASSURANCE

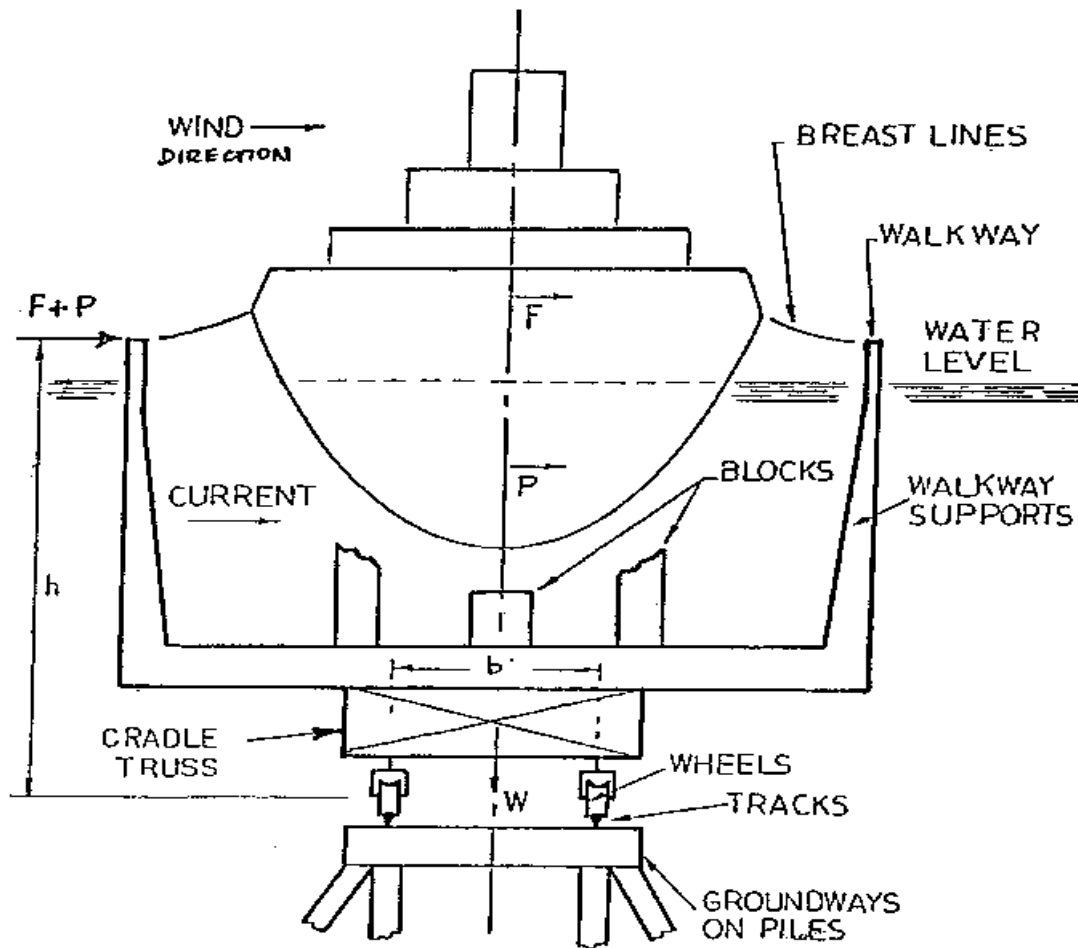
No additional requirements.

40. NOTES

40.1 Overturning moment formula. Figure 10 of MIL-STD-1625, illustrated on the following page, provides formulas for determining the overturning moment for a vessel on a railway.

40.2 Pumping plan formula. MIL-STD-1625 provides formulas for pumping plans.

MIL-STD-1625C(SH)
25 August 1987



h = Height of breast lines above top of tracks
 b = Width of track
 M_o = Overturning moment
 M_s = Stabilizing moment
 F = Wind load
 P = Current load
 W = Weight of cradle
 $F+P$ = Total load, assumed to be acting at the breast line

$$M_o = h(F+P) \quad M_s = \frac{Wb}{2}$$

SH 12381

FIGURE 10. Forces on cradle during docking.

APPENDIX C

REQUIREMENTS FOR SMALL BOAT HAUL-OUTS

10. SCOPE

10.1 Scope. This appendix describes the requirements for small boat haul-outs.

20. REQUIREMENTS

20.1 Alternate docking methods. When a drydock facility is not provided, the Contractor may alternately haul the vessel from the water by using a lifting cradle/lifting slings. The Contractor shall provide the COR with a copy of a notarized Certificate of Test indicating that a satisfactory full-load test of the lifting gear has been accomplished within 24 months before the drydocking date for the accommodation of a vessel with the displacement and dimensions specified in the Principal Characteristics section of this specification. Be aware that frayed or damaged boat hoist lifting straps are unacceptable at any time.

20.2 Transportation. If required in the work item, the Contractor shall ship the boat from its point of origin to the repair facility and, after all repairs, ship the boat back to its place of origin. Cradle the boat for shipping.

20.2.1 Ensure the boat is transported via an air ride trailer system or equal. The trailer system shall be designed for transportation of boats and shall have high shock damping and low vibration characteristics. Be aware that standard highway transportation trailers are unacceptable. Before shipping, provide documentation of the trailer's specific characteristics to ensure system is adequate for boat transportation.

20.2.2 After all authorized repairs, provide all necessary towage or handling to deliver it to the point of origin.

20.2.3 While the boat is being shipped, ensure the boat is protected from road debris. Repair any damage to the boat incurred during shipping.

20.3 Haul-out by heavy-lift gear. The Contractor shall haul the boat from the water or off a trailer or truck by using a suitable crane or travel lift. Submit to the COR a copy of a notarized Certificate of Test indicating that a satisfactory full load test of the lifting gear has been accomplished within 12-months before the haul-out date. Be aware that frayed or damaged boat hoist lifting straps are unacceptable at any time.

20.3.1 Haul out the boat within 72 hours after entering the Contractor's facility, unless another time, mutually agreeable with the Contractor and Coast Guard Inspector, has been established.

20.3.2 Haul out the boat without strain to the hull. If any tendency to strain or damage is observed, immediately re-float and make such corrections to the lifting gear or blocks as necessary to relieve the condition. Submit to the COR a written report of all corrective measures taken before continuing with docking.

20.3.3 Support the boat on blocks topped with two-inch thick softwood (pine or fir) caps in such a manner that there will be no deformation, strain, or damage to the boat. Do not position the blocks in way of transducers, sea chests, discharges, or other appendages as applicable.

20.3.3.1 Examine the support blocks for total contact.

20.3.3.2 Shim the blocks as necessary to provide total and even block contact with the boat's hull.

20.4 Hull cleaning. Within four hours of drydocking, the Contractor shall clean the entire interior and exterior surfaces of the boat including the strainer, rudder, propeller, strut and other underwater appendages with suitable solvent and clean fresh water. If the hull is fiberglass, remove all wax and other debris.

20.5 Hull inspection. Immediately after underwater wash, the Contractor shall notify the Contracting Officer's Representative to convene the Coast Guard Underwater Hull Inspection Board (UWHIB). Provide a hull repair supervisor and a marker to assist the UWHIB and to survey the underwater body. Do not begin hull repairs until the UWHIB has completed the initial underwater body survey.

20.6 Preparation. As soon as practicable after drydocking and hull cleaning, the Contractor shall install protective coverings over the propeller, shafting and bearings. After installation remove the coverings only while inspecting or accomplishing specific work items.

20.7 Strainer plate. The Contractor shall remove the strainer plate. After inspection, reinstall to its original configuration.

20.8 Packing. The Contractor shall remove all rudder and tail shaft packing. Thoroughly clean the packing glands. Fabricate and fit new packing to conform to the original configuration. Packing shall be recommended for stern tube service and shall not contain graphite. Reinstall packing glands. While boat is being floated, adjust the glands such that a fine trickle of water provides cooling.

20.9 Weight test. Following completion of all work, the Contractor shall perform a weight test of the boat in the presence of the Coast Guard Inspector. Weigh the boat dry (i.e., no fuel, oil, or water) and without the boat outfit. Show the current scale calibration to the Coast Guard Inspector to attest to the accuracy of the scale used for this weight test. Submit a report to the Contracting Officer's Representative documenting the weight of the boat (dry) and test results.

20.10 Protective covering removals. The Contractor shall remove all temporary protective coverings in their entirety after completing all underwater body work and before undocking the boat. Coverings shall remain in place until 12 hours before undocking.

20.11 Undocking preparations. For undocking operations, the Contractor shall provide personnel experienced in undocking operations and equipped with tools and appropriate communications. Station personnel at all hull openings associated with the work done by the Contractor during this availability.

20.12 Refloating. The Contractor shall notify the KO, in writing, of the estimated time of undocking, one day beforehand. Re-float the boat after all work has been completed, and thoroughly inspect for leaks and abnormal conditions once waterborne. If any leaks which cannot be readily repaired by simple bolt tightening are observed, haul out the boat and make needed repairs.

30. QUALITY ASSURANCE

No additional requirements.

40. NOTES

None.

APPENDIX D

REQUIREMENTS FOR DOCKING AND LIFTING CRADLES

10. SCOPE

10.1 Scope. This appendix describes the requirements for docking and lifting cradles, for 123/110/87-foot patrol boats.

20. REQUIREMENTS

20.1 Cradle option. If the Contractor chooses to drydock the designated patrol boat on a cradle, the Contractor shall ensure the following:

20.1.1 Docking cradle. The docking cradle shall be constructed, as shown on the applicable Coast Guard Drawing:

VESSEL CLASS	APPLICABLE COAST GUARD DRAWING
123-foot	123 WPB 100-002
110-foot	110 WPB 085-010 110 WPB 085-011 110 WPB 085-012
87-foot	87 WPB 085-010

20.1.2 Lifting cradle. The lifting cradle is similar to the docking cradle with additional pad eyes added to the structure to enable the cradle to be lifted with a crane or travel lift. The lifting cradle shall be constructed, as shown on the applicable Coast Guard Drawing:

VESSEL CLASS	APPLICABLE COAST GUARD DRAWING
110-foot	110 WPB 085-010 110 WPB 085-012
87-foot	87 WPB 085-012

NOTICE!

123-foot patrol boats may not be lifted in lifting cradles.

20.1.2.1 Proof test. Prior to lifting the vessel, proof test the cradle, as outlined below, in the presence of the Coast Guard Inspector:

- Using the lifting sling arrangement shown on applicable Coast Guard Drawing, lift the cradle with verified concrete weights suspended below it, to simulate the loading conditions that will exist when lifting the vessel. Ensure that the required proof test weights for the forward and aft portions of the cradle are distributed evenly from side to side, and the cradle is loaded as follows:

CRADLE LOAD DISTRIBUTION		
	LOAD FORWARD	LOAD AFT
110 WPB	49 Long Tons	77 Long Tons
87 WPB	55 Long Tons	55 Long Tons

- Raise and lower the cradle and testing weights at least three cycles. Then hold the cradle and weights suspended for twenty minutes and ensure that there is no slippage of wire rope in wire rope sockets. Through inspection check for deformation of steel any structure, or cracking in any welds.

20.1.2.2 Test report. The Contractor shall submit a written test result for the completed proof test to the COR, within 24 hours after completion of test.

NOTICE!

Upon acceptance by the COR, the satisfactory test report will serve as a certification of the cradle to lift other vessels of the same class without repeated proof tests. The certification is valid for a period of 24 months from the date of the proof test.

20.2 Deviation for 110/123-foot patrol boat cradle arrangement. If the Contractor wishes to propose a method other than the cradle arrangement specified herein for the 110/123-foot, the Contractor shall, in conjunction with the bid submittal, submit a detailed plan including blocking arrangement details and calculations, as specified in Appendix B.

NOTICE!

Historically the 110/123-foot patrol boats have had difficulties being drydocked using blocking methods that are other than in an approved cradle.

30. QUALITY ASSURANCE

No additional requirements.

40. NOTES

None.

APPENDIX E

REQUIREMENTS FOR FACILITY INSPECTION

10. SCOPE

10.1 Scope. This appendix describes the particular requirements for the contractor to perform drydock facility inspections.

20. REQUIREMENTS

20.1 Inspection checklists. The Contractor shall use the attached checklists to survey the Contractor's drydock facility.

20.2 Checklist validation. The Contractor shall have the completed checklists validated by a registered Professional Engineer. Be aware that the inspection cycle is based on the age of the dock, and is shown in the table below.

AGE OF DOCK	PERIODICITY
Less than 10 years	3 years
Over 10 years	2 years

20.3 Applicability. The Contractor shall complete the general section and all applicable sections of the checklists. Be aware that the Checklists cover the following:

- Floating Drydocks.
- Graving Drydocks.
- Marine Railways.
- Vertical Lifts.
- Travel Lifts/Cranes.
- Cradles.

30. QUALITY ASSURANCE

No additional requirements.

40. NOTES

None.

INSPECTION CHECKLISTS FOR DRYDOCKING FACILITIES CERTIFICATION

The Contractor shall use the attached checklist to survey their facilities. The following is a list of the minimum facility requirements with integrated inspection checklists for each type of docking facility. All required equipment or equipment that the Contractor intends to use, must be satisfactory at the time of the availability start date.

I hereby certify the material and operational conditions of the docking facility identified as _____, owned and operated by _____, are safe for docking vessels within the facility's rated capacity on this the _____ day of _____, in the year of _____.

Date: _____

Registration No. _____

Signature of Registered Professional Engineer: _____

INSPECTION CHECKLIST FOR GENERAL REQUIREMENTS (ALL TYPES)

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. _____ of _____

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
BLOCK HAULING MECHANISM						(Mark all that apply)
Sheaves						
Tracks						
Chain/cable						
Pawls						
Structural members						
Ratchets						
Hauling winches/motors						
Slides						
COMMUNICATION SYSTEMS (One of the below is required)						(Mark all that apply - Pass/Fail)
Public address system						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR GENERAL REQUIREMENTS (ALL TYPES)

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. _____ of _____

ITEMS INSPECTED	CONDITION					REMARKS
Radios						
Alarms						
Sound powered phones						
Dial telephones						
Bull Horn						
ELECTRICAL SYSTEMS AND EQUIPMENT Electric power system shall support maximum load, developed by simultaneous operation of the dewatering pumps, fire protection pumps, valve opening and closing mechanisms, hauling machinery, communications equipment, lighting, alarms, and any other support equipment or systems necessary for the safe operation of the facility.						
Main power source (One of the below is required)						(Required)
Shore power						
Diesel gen. Set						
Back-up power source						(Optional)
Shore power						
Diesel gen. Sets						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR GENERAL REQUIREMENTS (ALL TYPES)

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. _____ of _____

ITEMS INSPECTED	CONDITION					REMARKS
Electrical power distribution						(Required)
Lighting for operations & security						(Required)
Ship grounding straps						(Required)
Welding machine grounds						(Required)
FIRE PROTECTION SYSTEM (One of the below is required)						(Required)
Installed fire protection system compliant with Occupational Safety and Health Administration (OSHA) regulations						
Memorandum of agreement with a local fire department ensuring that that fire department can arrive at the facility within 30 minutes of receiving the alarm.						
FITTINGS/CONNECTIONS						(Mark all that apply)
Cleats						
Bollards						
Chocks						
Gratings						
Ringbolts						
Platforms						
Watertight doors, hatches, portlights and manholes						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR GENERAL REQUIREMENTS (ALL TYPES)

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ____ of ____

ITEMS INSPECTED	CONDITION					REMARKS
Gudgeon and pintle connections						
Bolted connections						
Attachments						
Reinforcements						
SHIP/DOCK HANDLING SYSTEMS AND EQUIPMENT (One of the below is required)						(Mark all that apply)
Capstans						
Winches						
Trolleys						
Translation chains and cables						
UNDERWATER INSPECTION Has there been an inspection performed within the last 5 years?						Required

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory
Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR FLOATING DRYDOCKS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

General Description. Attach a drawing of the dock showing general construction. Supply on the drawing or in a table the tank sizes, volumes and locations

LOA (ft)	
BOA (ft)	
Distance between wing walls (ft)	
Wing wall height (ft)	
Wing wall length (ft)	
Pontoon height (ft)	
Pontoon width (ft)	
The maximum water depth over the pontoon deck accounting for silt and tidal changes. (ft)	Max Depth: Tidal Range:
Maximum wind and current under which docking and undocking can be safely conducted. Determined by Contractor's SOP.	Max Wind: Max Current:
Maximum rated capacity of the drydock and the maximum load per foot.	Max Capacity (LT): Max LT/FT:
Maximum differential water levels permitted on tank bulkheads.	FT:
A current estimated weight & KG shall show the drydock in the light operating condition with all ballast tanks at the residual water levels. A correction shall be added for deck load, marine growth and silt accumulation in the tanks.	Current WT (LT): Current KG:

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory.

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR FLOATING DRYDOCKS

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
BALLASTING SYSTEM						(Required)
Do pumps operate?						(Pass/Fail)
Ballast and deballast in less than eight hours.						(Pass/Fail)
Do valves operate?						(Pass/Fail)
DEFLECTION DETECTION SYSTEM (Describe system if applicable)						(Optional)
DRAFT BOARDS Draft boards showing depth of water over pontoon deck at the wingwalls near the four inboard corners and at mid-length on the port and starboard sides.						(Required - Pass/Fail)
METHOD FOR DETERMINING TANK LEVELS						(Mark all that apply. One of the below is required)
Tank level indicators						
Sounding tubes						
HULL STRUCTURE Metal structural members shall have no more than 25% wastage. Wood structural members shall be free of wood rot, marine bores and deemed in good condition.						
Pontoon deck						
Pontoon sides/ends						
Pontoon bottom						
Wingwalls sides/ends						
Wingwall top deck						
Safety/machinery decks						
Interior Ballast/trim/ buoyancy tanks						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR FLOATING DRYDOCKS

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
Trusses/girders/frames/ beams						
Longitudinals						
Swash bulkheads						
Watertight bulkheads						
Fuel/water tanks						
Coatings						
MOORING SYSTEM						(Required)
SECURE WT HANDLING EQUIPMENT The weight handling securing systems shall be demonstrated to verify that these systems are adequate to hold under conditions of maximum list and trim.						(If applicable)
STABILITY AND BUOYANCY CRITERIA Docking facility shall meet the following freeboard and buoyancy characteristics.						Mark as applicable
Open-ended drydocks The minimum achievable freeboard of the pontoon deck of the drydock (excluding pits) with the rated maximum load lifted shall be 12 inches. During normal operation, nine inches of freeboard is permissible.						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR FLOATING DRYDOCKS

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
Closed-ended drydocks Minimum freeboard with the rated maximum load lifted shall be nine inches, measured from the sill of the stern (or bow) gates.						
Drydocks in the fully ballasted down condition During controlled ballasting of the drydock, the minimum freeboard (measured from the top deck at side) shall be 12 inches.						Required (Pass/Fail)
The facility must have an emergency plan or data demonstrating that failure of a pump or loss of pumping capacity will neither put the drydock out of operation nor cause damage to either the drydock or a ship in drydock.						Required (Pass/Fail)

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory
Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR GRAVING DRYDOCKS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

General Description. No drawing required-

Length of floor (ft)	
Width of dock opening (ft)	
Depth of dock (ft)	
The maximum water depth over the drydock sill, while accounting for tidal ranges and silt accumulation.	Max Depth: Tidal Range:
Maximum wind and current under which docking and undocking can be safely conducted. Determined by Contractor's SOP.	Max Wind: Max Current:
Facility's rated capacity in total weight and LT/ft.	Max Capacity (LT): Max LT/FT:

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR GRAVING DRYDOCKS

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
BALLASTING SYSTEM						(Required)
Do pumps operate?						(Pass/Fail)
Ballast and deballast in less than twelve hours.						(Pass/Fail)
Do valves operate?						(Pass/Fail)
STRUCTURES Inspect for significant cracks, leakage, spalling, inward/outward movement of vertical surfaces, upward or downward displacement of floor, and settlement of soil around dock.						(Mark all that apply)
Coping						
Walls						
Galleries						
Altars						
Service tunnels						
Floor						
Aprons						
Caisson seats						
Drainage culverts						
Drainage tunnels						
Flooding tunnels						
Discharge tunnels						
Pressure relief system						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR GRAVING DRYDOCKS

CAISSON						(Required)
Shell plating/Sheathing						
Structural framing						
Bulkheads						
Deck plating						
Top deck coverings						
Fenders						
Backing for seals						
Seals						
Fixed ballast						
DRAFT BOARDS Draft boards showing depth of water over dock floor near the four inboard corners and at mid-length on the port and starboard sides.						(Pass/Fail)
PUMP HOUSES General Condition						(Pass/Fail)

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR MARINE RAILWAYS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ____ of ____

General Description. No drawing required.

LOA of cradle (ft)	
Width between wingwalls of cradle (ft)	
Width between rails (ft)	
The maximum water depth over the cradle floor, while accounting for silting and tidal ranges.	Max Depth: Tidal Range:
Maximum wind and current under which docking and undocking can be safely conducted. Determined by Contractor's SOP.	Max Wind: Max Current:
Facility's rated capacity in total weight and LT/ft.	Max Capacity (LT): Max LT/FT:

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR MARINE RAILWAYS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
CRADLES						(Required)
General conditions						
Decking						
Block bearers						
Elevated frameworks						
Under deck frameworks						
Drawhead girder						
Bottom chords						
Bitumastic enamel on steel						
Preservative on wood						
Wheel bearing supports						
DRAFT BOARDS						(Pass/Fail)
Draft boards showing depth of water over cradle floor at the wingwalls near the four inboard corners and at mid-length on the port and starboard sides.						
GROUNDWAYS & RAILS						(Required)
Inspect above water portion and splash zone						
Alignment of tracks						
Settlement of tracks						
Piles						
Stringers						
Cross bracing						
Track plates & fasteners						
Rail & fasteners						
Chain guides						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR MARINE RAILWAYS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
Mud & silt conditions						
Wheels						
Wheel bearings						
Rollers						
Roller spindles						
Roller frames						
Spacer blocks						
Wood filler pieces						
CHAINS, CABLES & SHEAVES Inspect for fit and percentage of wear						(Required)
Inhaul chains or cables						
Outhaul chains or cables						
Inhaul sheaves						
Outhaul sheaves						
Chain connecting links						
Sheave fasteners						
Chain slack & fit						
HAULING MACHINERY Inspect for lubrication, condition, fit and foundation						(Required)
Gearing						
Shafting						
Bearings						
Sprockets and wildcats						
Cable drums						
Frames						
Electric brakes						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR MARINE RAILWAYS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ____ of ____

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
Hand brakes						
Locking pawls						
Clutches						
Safety guards						
Electric motors						
Diesels/gas engines						
Steam/compressed air drives						
Controllers						
Speed limit devices						
Control boards						
Switches						
Safety devices & alarms						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR VERTICAL LIFTS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ____ of ____

General Description. No drawing required.

LOA of platform (ft)	
BOA of platform (ft)	
Width between rails (ft)	
The maximum water depth over the lifting platform, while accounting for tidal ranges and silt accumulation.	Max Depth: Tidal Range:
Maximum wind and current under which docking and undocking can be safely conducted. Determined by Contractor's SOP.	Max Wind: Max Current:
Facility's rated capacity in total weight and LT/ft.	Max Capacity (LT): Max LT/FT:

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST VERTICAL LIFTS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
HOIST Inspect for unusual running noises, lubrication, condition of wire rope, and foundations						(Required)
Motors						
Gears						
Brakes						
Wire ropes						More than 2 broken wires per wire rope requires replacement.
Bearings						
Drums						
Foundation platform						
Anchorage						
Piles						
Lubrication system						
Wiring						
PLATFORM Inspect for soundness of structure						(Required)
Main transverse beams						
Secondary transverse beams						
Longitudinal beams						
Stiffeners						
Decking						
Sheaves						
Bearings						
Sheave housings						
Tracks						
Pins						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory
Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST VERTICAL LIFTS

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

CRADLES Inspect for soundness of structure						(Required)
Main transverse beams						
Secondary transverse beams						
Stiffeners						
Longitudinal beams						
Wheels/rollers/roller plates						
Roller spindles/wheel axles						
Block bearers						
TRANSFER SYSTEM Inspect for unevenness in heights of tracks, excessive corrosion, hitching mechanism						(Required)
Tracks						
Hauling device						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR TRAVEL LIFTS/CRANES

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ____ of ____

General Description. No drawing required.

LOA of travel lift (ft)	
Height from ground to cross bar (ft)	
Max allowable width of vessel (ft)	
Distance from ground to high water level (ft)	
Length of lifting cables (ft)	
Single or double upper cross tree	
The maximum draft, while accounting for tidal ranges and silt accumulation.	Max Draft: Tidal Range:
Maximum wind and current under which docking and undocking can be safely conducted. Determined by Contractor's SOP.	Max Wind: Max Current:
Travel Lift's overall rated capacity and strap capacity.	Max Capacity (LT): Strap Capacity (LT):

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST TRAVEL LIFTS/CRANES

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

ITEMS INSPECTED	CONDITION					REMARKS
	U	M	NA	NI	S	
DRIVE MECHANISM Inspect brakes, tires, wheels, bearing, emergency brake						(Required)
HOIST						(Required)
Transmission motor & Brake						
Emergency Brake						
Trolley & hoist block						
Transverse reducer and motor						
Wire						
Straps/Slings/Preventers						
Sheaves						
Drum						Minimum of two wraps on drum at lowest position
HYDRAULICS Hoses, fittings, tank, motor, valves, pump & fluid levels						(Required)
ENVIRONMENT						(Required)
Overhead clearance						
Road surface						
Final blocking surface						
STRUCTURE Top Beam, column platform, side beam						(Required)

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST TRAVEL LIFTS/CRANES

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ___ of ___

PIER FACILITY						(Required)
Surface Condition						
Pilings						
Stops						
LOAD TEST						(Required)
Load applied:						
Date of Test:						
Rated Capacity:						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory

Note: All marginal and unsatisfactory items shall be addressed in remarks.

INSPECTION CHECKLIST FOR DOCKING/LIFTING CRADLE

INSPECTED BY _____

Date _____

FACILITY ID. _____

Sheet No. ____ of ____

	CONDITION					REMARKS
	U	M	NA	NI	S	
CRADLES						
General conditions						
Vertical guide post						
Weld joints						
Drain plugs removed and inspect bilge block supports						
Drain plug removed and inspect spreader bar and sway brace interior						
Pad eyes						
Centering track alignment check						
Bolt Joints						
Preservative on steel sections						

U=Unsatisfactory M=Marginal NA=Not applicable NI=Not inspected S=Satisfactory
Note: All marginal and unsatisfactory items shall be addressed in remarks.

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APPENDIX F

DOCKING AND UNDOCKING CHECKLISTS

10. SCOPE

10.1 Scope. This appendix provides checklists for the docking and undocking procedure.

20. REQUIREMENTS

20.1 Inspection checklists. The following checklists are to be completed by the COR. They are provided for the Contractor's information.

20.2 Applicability. The checklists below are designed to be generic as possible. Some items may not apply to the docking or blocking method being used. The checklists cover:

- Pre-docking Conference checklist.
- Pre-docking Dock Inspection.
- During & Post Docking Inspection.
- Pre-Undocking Conference Check List.
- Undocking Evolution.

30. QUALITY ASSURANCE

No additional requirements.

40. NOTES

None.

PRE-DOCKING CONFERENCE CHECK LIST

ITEM	SAT	UNSAT
DOCUMENTATION TO BE PROVIDED		
Current Dock Certification		
Operating practices, safety requirements, and yard security plans.		
Docking Calculations		
Blocking Arrangement (If different from docking plan)		
Docking Procedure		
FACILITY SAFETY EQUIPMENT		
Fire alarm locations		
Emergency power		
Emergency ballast/dewatering pumps		
REVIEW		
The flooding and pumping plan for the drydock. (allowable trim and deflection)		
Specific list, trim and drafts of the vessel during docking. (Grounding, when blocks are hauled) Critical Draft -		
GM of ship dock system all phases (Floating DD only - Not less than 5' except on docks of greater than 10,000 LT capacity)		
Block Loading - Trapezoidal, Knuckle		
Any special precautions or actions characteristic to the docking facility, the docked vessel, or a combination.		
High/low water, currents, weather		
Communications plan		
Tug plan		
Cutter entry plan (Line handlers, fenders)		
Cutter clearance above keel blocks, side blocks and other potential obstructions		
Docking position		
Procedure for positioning cutter in dock		
When to secure ship's power		
Use of divers		
Arrange time for block inspection		
Time & Date of Drydocking _____		
CUTTER CONDITION		
Verify cutter load condition (tanks, drafts, displacement)		
All equipment retracted		
Verify Temporary Services/hookups		

Drafts:FWD	,	MID	,	AFT		
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PRE-DOCKING DOCK INSPECTION

ITEM	SAT	UNSAT
FOUNDATION BLOCK - TIMBER		
Check timber for excessive crushing, warping, cracking, rot and degraded material		
Note amount of wear from spiking and dogging		
Evaluate the condition of the interfacing between blocks in the stack		
Note condition of the fasteners in the blocks		
Note arrangements for preventing tripping and floating of blocks		
FOUNDATION BLOCK - CONCRETE		
Structural damage due to over loads		
Corrosion of steel reinforcement		
Concrete for cracking, spalling and exposed rebar		
FOUNDATION BLOCK - STEEL		
Evaluate the loss of steel due to corrosion		
Look for cracks in welds		
Deformed structure		
BLOCKS - GENERAL		
Soft Caps min thickness 2" & no crush		
Spacing & location as per blocking arrangement (+/- 1/2" transversely +/- 1" longitudinally, +/- 1/4" height)		
KEEL BLOCKS		
Sight keel block line for alignment and fit		
Keel block height meets requirement		
Keel Profile applied to keel block offsets		
BILGE BLOCKS		
Sight bilge block line for alignment and fit		
Bilge blocks are required dimensions		
Bilge block construction. (Normal force passes through middle 1/3 of all blocks, no gaps, cribbing if over 6')		
MISCELLANEOUS		
Crane clearance		
Check overhead interferences and clearances		
Depth of water (Tide dependent)		
Condition of the working floor for debris, unevenness etc.		
Note mooring system, possibility of streaming		
Note draft/trim devices in use		
Condition of fendering		
Condition of Lifting Straps		

DURING & POST DOCKING INSPECTION

ITEM	SAT	UNSAT
DURING DOCKING EVOLUTION		
Time & date bow crosses sill.		
Cutter came in smoothly. Could it have hit any underwater obstacles?		
Position of the cutter is correct.		
Correct draft of dock when cutter grounds		
Correct drafts of dock & cutter when cutter is landed		
Check for cutter list and alignment		
Correct draft of cutter when bilge blocks are hauled		
All bilge blocks were hauled fully		
Draft of cutter when setting down on pre-set bilge blocks		
Keel Centered on keel blocks		
Trim and docking plan being followed		
POST DOCKING EVOLUTION		
Proper Contact area (Wedges may be required) If inadequate area refloat (Less than 80%)		
Drafts of dock		
(FWD _____, MID _____, AFT _____)		
Does dock have a hog or sag?		
Are any blocks hitting appendages?		
Any appendages not shown on docking plan or in wrong location?		
Excessive crush of blocks? Location:		
Verify correct position of cutter on blocks		
Ensure side haul blocks are locked in position		
Damage to cutter (describe below)		

PRE-UNDocking CONFERENCE CHECK LIST

ITEM	SAT	UNSAT
DOCUMENTATION TO BE PROVIDED		
Recorded Weight Shifts during availability		
Undocking Calculations		
Undocking Procedure		
UNDocking REPORT		
Transducers uncovered		
Zincs uncovered and free of paint		
Shaft rope guard & fairwaters in place		
Hull opening blanks & plugs removed		
Sea chest strainers are bolted in place and lockwired		
Sea valves & waster pieces are properly installed and are in the closed position		
All underwater body work has been completed		
Dock is free of all debris and blasting material		
REVIEW		
The flooding and pumping plan for the drydock. (allowable trim and deflection)		
Specific list, trim and drafts of the vessel during undocking. (when side blocks are hauled)		
GM of ship dock system all phases(Floating DD only - Not less than 5' except on docks of greater than 10,000 LT capacity)		
High/low water, currents, weather		
Communications plan		
Tug plan		
Temporary services disconnection		
Cutter exit plan (Line handlers, fenders)		
Cutter clearance above keel blocks, side blocks and other potential obstructions		
Pier Location & Temporary services hookup		
Where personnel will be stationed (All hull openings that were worked on)		
Procedure if immediate re-docking is required		
Is ballast required for undocking?		
Time & Date of Undocking ,		
CUTTER CONDITION		
Verify cutter load condition (tanks, drafts, displacement) Perform Tank sounding within 12 hours of undocking.		

UNDOCKING INSPECTION

ITEM	SAT	UNSAT
DURING UNDOCKING EVOLUTION		
All equipment retracted		
Verify Temporary Services/disconnection		
Personnel at hull openings		
Stopped at correct draft for hauling side blocks		
Hauled ALL side blocks FULLY		
Detection of any leaks		
Cutter exited smoothly. Could it have hit any underwater obstacles?		
Time & date bow crosses sill _____, _____		
Drafts:FWD _____, MID _____, AFT _____		
Damage: (describe below)		